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(54) **DENTAL SCALER SYSTEM**

GERÄT FÜR DIE ZAHNSTEINENTFERNUNG

SYSTEME DE DETARTRAGE DENTAIRE

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Description

[0001] The invention relates to dental scalers for scaling teeth. More specifically the invention provides an improved dental scaler and reservoir for scaling teeth.

BACKGROUND OF THE INVENTION

[0002] A dental scaler is known from US 5,927,977.

[0003] Schuman et al disclose a dental scaler and reservoir system in US Patent _____ USSN 08/723,199 (Dentsply). Prior art dental scaler and reservoir systems do not support a dental scaler on a reservoir and connect it to a compressor system, as is provided by the present invention. Prior art dental scaler and reservoir systems do not provide a dental scaler, which is operable both with and without a reservoir, as is provided by the present invention. The prior art does not provide a dental scaler and reservoir system, having a scaler housing enclosing a scaler valve, a compressor housing enclosing a reservoir valve and a compressor, a reservoir housing having an inner chamber, wherein the scaler housing is supported by the reservoir housing, and the compressor housing is supported by and connected to the scaler housing and the reservoir housing. The prior art does not provide a method of using a dental scaler system, comprising: providing a first scaler conduit and a dental scaler system comprising a scaler system comprising a scaler housing enclosing a second scaler conduit, and scaler valve, the first scaler conduit not being connected in fluid flow communication with the scaler valve, providing a handpiece system comprising scaler tip and a handpiece housing enclosing a handpiece conduit and handpiece valve, connecting the handpiece conduit in fluid flow communication to the first scaler conduit, conveying a first fluid through the first scaler conduit, scaler valve, and handpiece valve to the scaler tip, connecting the handpiece conduit in fluid flow communication to the second scaler conduit, and conveying a second fluid through the second scaler conduit, and handpiece valve to the scaler tip. Nor does the prior art provide a method of using a dental scaler system, comprising providing a dental scaler system comprising a scaler system, a compressor system and a handpiece system. The scaler system comprising a scaler housing enclosing a scaler conduit, and scaler valve. The compressor system comprises a reservoir and a compressor housing enclosing a compressor and a compressor conduit. The reservoir comprising a container enclosing reservoir fluid in a container chamber. The handpiece system comprising scaler tip and a handpiece housing enclosing a handpiece conduit and handpiece valve. The handpiece conduit is connected in fluid flow communication to compressor conduit. At least a portion of the reservoir fluid is conveyed through the compressor conduit, scaler valve, and handpiece valve to the scaler tip. The handpiece conduit is connected in fluid flow communication to the scaler conduit and water conveyed through the scaler conduit, and handpiece valve to the scaler tip. When the handpiece conduit is connected in fluid flow communication to the compressor conduit, the compressor housing is connected to the scaler housing and the reservoir housing, the scaler handpiece is supported by the reservoir housing. When the handpiece conduit is connected in fluid flow communication to the scaler conduit, the scaler housing is supported by a substantially horizontal surface.

[0004] The problems of the prior art are overcome by the present invention.

OBJECTS OF THE INVENTION

[0005] It is an object of the invention to provide a dental scaler and reservoir system supporting a dental scaler on a reservoir and connect it to a compressor system.

[0006] It is an object of the invention to provide a dental scaler and reservoir system providing a dental scaler which is operable both with and without a reservoir.

[0007] It is an object of the invention to provide a dental scaler and reservoir system, having a scaler housing enclosing a scaler valve, a compressor housing enclosing a reservoir valve and a compressor, a reservoir housing having an inner chamber, wherein the scaler housing is supported by the reservoir housing, and the compressor housing is supported by and connected to the scaler housing and the reservoir housing.

[0008] It is an object of the invention to provide a scaler and reservoir system, comprising: a scaler handpiece having a scaling tip, a scaler housing enclosing a scaler valve, a compressor housing enclosing a reservoir valve and a compressor, a reservoir housing having an inner chamber, the scaler housing is supported by the reservoir housing, and the compressor housing is supported by and connected to the scaler housing and the reservoir housing, the scaler handpiece is connected to the scaler housing, vibrates the tip, and scales a tooth in a patient's tooth by positioning the scaling tip adjacent to the tooth.

[0009] It is an object of the invention to provide a dental scaler and reservoir system for use in a method of using a dental scaler system, comprising: providing a first scaler conduit and a dental scaler system comprising a scaler system comprising a scaler housing enclosing a second scaler conduit, and scaler valve, the first scaler conduit not being connected in fluid flow communication with the scaler valve, providing a handpiece system comprising scaler tip and a handpiece housing enclosing a handpiece conduit and handpiece valve, connecting the handpiece conduit in fluid flow communication to the first scaler conduit, conveying a first fluid through the first scaler conduit, scaler valve, and handpiece valve to the scaler tip, connecting the handpiece conduit in fluid flow communication to the second scaler conduit, and conveying a second fluid through the second scaler conduit, and handpiece valve to the scaler tip.

[0010] It is an object of the invention to provide a dental scaler and reservoir system for use in a method of using

a dental scaler system, comprising providing a dental scaler system comprising a scaler system, a compressor system and a handpiece system. The scaler system comprising a scaler housing enclosing a scaler conduit, and scaler valve. The compressor system comprises a reservoir and a compressor housing enclosing a compressor and a compressor conduit. The reservoir comprising a container enclosing reservoir fluid in a container chamber. The handpiece system comprising scaler tip and a handpiece housing enclosing a handpiece conduit and handpiece valve. The handpiece conduit is connected in fluid flow communication to compressor conduit. At least a portion of the reservoir fluid is conveyed through the compressor conduit, scaler valve, and handpiece valve to the scaler tip. The handpiece conduit is connected in fluid flow communication to the scaler conduit and water conveyed through the scaler conduit, and handpiece valve to the scaler tip.

BRIEF DESCRIPTION OF THE DRAWING

[0011]

FIGURE 1 is a frontal perspective view of a dental scaler and reservoir system in accordance with the invention.

FIGURE 2 is a rear perspective view of a dental scaler and reservoir system in accordance with the invention.

FIGURE 3A is a bottom perspective view of a dental scaler and reservoir system in accordance with the invention.

FIGURE 3 is a frontal perspective view of the compressor housing and reservoir housing of the dental scaler and reservoir system in accordance with the invention shown in FIGURES 1 and 2.

FIGURE 4 is a frontal perspective view of the dental scaler of the dental scaler and reservoir system in accordance with the invention shown in FIGURES 1 and 2.

FIGURE 5 is a rear perspective view of the dental scaler of the dental scaler and reservoir system in accordance with the invention shown in FIGURES 1 and 2.

FIGURE 6 is a bottom perspective view of the dental scaler of the dental scaler and reservoir system in accordance with the invention shown in FIGURES 1 and 2.

FIGURE 7 is a frontal perspective view of the compressor housing of the dental scaler and reservoir system in accordance with the invention shown in FIGURES 1 and 2.

FIGURE 8 is a perspective view of the compressor system of the dental scaler and reservoir system in accordance with the invention shown in FIGURES 1 and 2.

FIGURE 9 is a top perspective view of the scaler control system of the dental scaler and reservoir system in accordance with the invention shown in FIGURES 1 and 2.

FIGURE 10 is a perspective view of a handpiece housing for use with the dental scaler and reservoir system in accordance with the invention shown in FIGURES 1 and 2.

FIGURE 10A is a cross-sectional side view of a handpiece, conduit and connector for use with the dental scaler and reservoir system in accordance with the invention shown in FIGURES 1 and 2.

FIGURE 10B is a side view of an insert for a handpiece for use with the dental scaler and reservoir system in accordance with the invention shown in FIGURES 1 and 2.

FIGURE 11 is a cross-sectional side view of a handpiece housing for use with the dental scaler and reservoir system in accordance with the invention shown in FIGURES 1 and 2.

FIGURE 12 is an end view of the handpiece housing shown in FIGURE 11.

FIGURE 13 is a partial cross-sectional side view of the handpiece housing shown in FIGURE 11.

FIGURE 14 is a schematic diagram of the use of the dental scaler system in accordance with the invention shown in FIGURES 4 through 6.

FIGURE 15 is a schematic diagram of the dental scaler and reservoir system in accordance with the invention shown in FIGURES 1 and 2.

FIGURE 16 is a schematic diagram circuitry for the dental scaler and reservoir system in accordance with the invention shown in FIGURES 1 and 2.

SUMMARY OF THE INVENTION

[0012] The present invention provides a dental scaler and reservoir system as defined by the claims.

[0013] The invention provides a scaler and.reservoir system, comprising: a scaler handpiece having a scaling tip, a scaler housing enclosing a scaler valve, a compressor housing enclosing a reservoir valve and a compressor, a reservoir housing having an inner chamber, the scaler housing is supported by the reservoir housing, and the compressor housing is supported by and connected to the scaler housing and the reservoir housing, the scaler handpiece is connected to the scaler housing, vibrates the tip, and scales a tooth in a patient's tooth by positioning the scaling tip adjacent to the tooth.

[0014] The invention provides a dental scaler and reservoir system, comprising: a scaler housing, a scaler valve, a compressor housing, a reservoir valve, a compressor, a reservoir housing having an inner chamber, a handpiece housing having a handpiece valve and a vibrating member. The scaler housing is supported by the reservoir housing. The compressor is connected to compressor conduit. The compressor conduit is connected to the inner chamber of the reservoir housing thereby providing fluid flow communication between the compressor and the inner chamber of the reservoir housing.

The inner chamber of the reservoir housing is connected to reservoir conduit. The reservoir conduit is connected to the reservoir valve thereby providing in fluid flow communication between the inner chamber and the reservoir valve. The reservoir valve is connected to handpiece conduit. The handpiece conduit is connected to the handpiece valve thereby providing fluid flow communication between the reservoir valve and the handpiece valve.

[0015] A method of using a dental scaler system is provided, comprising: providing a first scaler conduit and a dental scaler system comprising a scaler system comprising a scaler housing enclosing a second scaler conduit, and scaler valve, the first scaler conduit not being connected in fluid flow communication with the scaler valve, providing a handpiece system comprising scaler tip and a handpiece housing enclosing a handpiece conduit and handpiece valve, connecting the handpiece conduit in fluid flow communication to the first scaler conduit, conveying a first fluid through the first scaler conduit, scaler valve, and handpiece valve to the scaler tip, connecting the handpiece conduit in fluid flow communication to the second scaler conduit, and conveying a second fluid through the second scaler conduit, and handpiece valve to the scaler tip.

[0016] A method of using a dental scaler system is provided, comprising providing a dental scaler system comprising a scaler system, a compressor system and a handpiece system. The scaler system comprising a scaler housing enclosing a scaler conduit, and scaler valve. The compressor system comprises a reservoir and a compressor housing enclosing a compressor and a compressor conduit. The reservoir comprising a container enclosing reservoir fluid in a container chamber. The handpiece system comprising scaler tip and a handpiece housing enclosing a handpiece conduit and handpiece valve. The handpiece conduit is connected in fluid flow communication to compressor conduit. At least a portion of the reservoir fluid is conveyed through the compressor conduit, scaler valve, and handpiece valve to the scaler tip. The handpiece conduit is connected in fluid flow communication to the scaler conduit and water conveyed through the scaler conduit, and handpiece valve to the scaler tip. When the handpiece conduit is connected in fluid flow communication to the compressor conduit, the compressor housing is connected to the scaler housing and the reservoir housing, and the scaler handpiece is supported by the reservoir housing. When the handpiece conduit is connected in fluid flow communication to the scaler conduit, the scaler housing is supported by a substantially horizontal surface.

[0017] A method of using a dental scaler system is provided comprising: providing a scaler system, and a compressor system. The scaler system comprises a scaler housing enclosing an electrical dental scaler circuit connected by an electrical conductor an electrical scaler connector, scaler conduit connected to a scaler valve. The compressor system comprises a reservoir and a compressor housing enclosing an electrical compressor connector connected by an electrical conductor to a compressor and a compressor conduit connected to the reservoir. The reservoir comprises a container enclosing reservoir fluid in a container chamber. The electrical dental scaler circuit produces ultrasonic oscilating current while the electrical compressor connector and the electrical scaler connector are connected, the scaler housing is supported by the reservoir and the compressor conduit is in fluid flow communication with a handpiece. The electrical dental scaler circuit produces ultrasonic oscilating current while the electrical compressor connector and the electrical scaler connector are disconnected, the scaler housing and the compressor housing are separated and the scaler conduit is in fluid flow communication with a handpiece.

DETAILED DESCRIPTION OF THE INVENTION

[0018] The invention is now described with more particular reference to FIGURES 1 through 16. Dental scaler and reservoir system 10, includes scaler housing 12, compressor housing 16 and reservoir housing 14. Scaler housing 12 and compressor housing 16 are preferably made of molded rigid polymeric plastic, such as polypropylene. Scaler housing base12B is preferably made of aluminum. The upper face of scaler housing 12 has handpiece holding groove 11G and power indicator light 11P. Reservoir cap 12C is connected by threads to reservoir fill opening connector 13 of reservoir housing front portion 14R which extends beyond scaler housing 12. Scaler handpiece 18 is connected by flexible conduit 20 to compressor housing 16. Between uses handpiece 18 is supported by groove. Front feet 24 and 26 and rear 24R and 26R are connected to reservoir housing 14. Power control knob 22 is connected through scaler housing 12 to switch 112 of scaler circuit 114 shown in FIGURE 16. When the compressor is in use, compressor housing 16 is connected by handpiece cord connector 16H to handpiece connector 20C, by an electrical foot switch cord connector 16F to a foot switch, and by an electrical power cord connector 16P to an electrical power outlet.

[0019] With more particular reference to FIGURES 1 through 9 is seen that compressor housing 16 has a one sixth turn connector 32 and reservoir housing 14 has a one sixth turn connector 34. When dental scaler and reservoir system 10 is in assembled position one sixth turn connector 34 engages one sixth turn connector 32. Scaler housing 12 has snap fit catch 38. Snap fit connector 38C connected catch 38 to the scaler housing 12. Reservoir housing 14 is preferably made of molded rigid polymeric plastic, such as polypropylene, and has snap fit connector 40. When dental scaler and reservoir system 10 is in assembled position snap fit connector 40 engages snap fit catch 38. When dental scaler and reservoir system 10 is in assembled position inner compressor control connector 44 engages and provides electrical connection to outer compressor control connector 46. When dental scaler and reservoir system 10 is in assembled position

compressor control connector flange 44F extends into compressor control connector recess wall 44R. Front feet 24S and 26S and rear 24RS and 26RS are connected to scaler housing base 12B.

[0020] When dental scaler and reservoir system 10 is in assembled position conduit connector 67 fits into recess 67R. When the scaler is being used without the compressor, scaler housing 12 is connected by handpiece cord connector 12H to handpiece connector 20C, by an electrical foot switch cord connector 12F to a foot switch, and by an electrical power cord connector 12P to a power outlet.

[0021] With more particular reference to FIGURES 10 through 13 is seen pollisher handpiece 118 having valve 154 and conduit connector 170. Connector 170 has arm 172 and is enclosed by rotatable handpiece cap 174. Handpiece cap 174 is rotatably connected to handpiece body 176. Handpiece cap 174 has ribs 178. Connector 170 is adjusted by rotating handpiece cap 174. Arm 172 fits into a groove 173 in cap 174 and turns connector 170 as handpiece cap 174 is rotated. Connector 170 is connected to tube 170T. Ultrasonic scaling insert 180 is positioned into the insert chamber enclosed by insert channel wall 182 and within coil 18C. Coil 18C is connected by electrical conductor 18E to pin 18P. Electrical conductor is connected to pin 18P. Connector 170 and electrical conductor 18E extend through conduit 20 to handpiece connector 20C. 18E Ultrasonic scaling tip 184 is connected to insert 180.

[0022] With more particular reference to FIGURE 14 is seen an operational dental scaler system using dental scaler 11. Conduit 66 is connected through conduit connector 67 to source of pressurized fluid 64. The pressurized fluid is for example liquid water at 23°C and from 1.034-4.1 bar (about 15 to about 60 psig). Dental scaler 11 is operated to convey fluid from source of pressurized fluid 64 through conduit 66, valve 50, conduit 52, valve 54 conduit 55 to tooth T. In use the flow of fluid through conduit 55 is adjustable from about 5 ml per minute to about 55 ml per minute. In use tip 184 is vibrated at a frequency of about 23,500 to about 26,500 Hz.

[0023] Handpiece 18 is connected to dental scaler 11 through flexible conduit 20. Dental scaler 11 is then operated to convey fluid from source of pressurized fluid 64 through conduit 66, valve 50, conduit 52, valve 154 to tooth T.

[0024] Dental scaler and reservoir system 10 is operated to convey fluid as shown in FIGURE 15. Dental scaler and reservoir system 10 is operated to convey fluid from a chamber enclosed by reservoir 14 through connector opening 57C, conduit 57, valve 56, conduit 58, valve 54 conduit 55 to tooth T. Compressed air from compressor 60 is coveyed through conduit 62 and connector opening 62C into the space above the fluid in reservoir 14 to raise the pressure above the fluid preferably to from 1.034-1.379 bar (about 15 to about 20 psig). When valve 56, and valve 54 are open compressed air in the space above the fluid in reservoir 14 forces the fluid from reservoir 14 through conduit 57, valve 56, conduit 58, valve 54 conduit 55 to tooth T. Optionally, conduit 62 is vented to the atmosphere through push button pressure relief valve 62V. In use the flow of fluid through conduit 55 is adjustable from about 5 ml per minute to about 55 ml per minute. In use tip 184 is vibrated at a frequency of about 23,500 to about 26,500 Hz. Preferably valves 50 and 56 are a solenoid valves.

[0025] With more particular reference to FIGURE 16 is seen circuitry 114 for the dental scaler system 11. Circuitry 114 is for example a system for continuous control of tip vibration disclosed by Jovanovic et al in U. S. Patent 5,754,016. In use circuitry 114 generates a current oscillating at an ultrasonic frequency and this current is conducted by electrical conductors to coil enclosed within handpiece housing 18.

[0026] Thus, dental scaler and reservoir system 10 comprises a scaler housing 12, a scaler valve, a compressor housing 16, a reservoir valve, a compressor, a reservoir housing 14 having an inner chamber, a handpiece housing 18 having a handpiece valve and a vibrational member. The scaler housing 12 is supported by the reservoir housing 14. The compressor is connected to compressor conduit. The compressor conduit is connected to the inner chamber of the reservoir housing thereby providing fluid flow communication between the compressor and the inner chamber of the reservoir housing. The inner chamber of the reservoir housing is connected to reservoir conduit. The reservoir conduit is connected to the reservoir valve thereby providing in fluid flow communication between the inner chamber and the reservoir valve. The reservoir valve is connected to handpiece conduit. The handpiece conduit is connected to the handpiece valve thereby providing fluid r flow communication between the reservoir valve and the handpiece valve.

[0027] The reservoir container 14 is shaped to be easily wiped clean. All cords and tubing are easily removed from the unit. Preferably, an external switching power supply is utilized to give an output of 30 volts of direct current (DC) with an input voltage of 90-264 volts alternating current (VAC), 47-63 Hz. Preferably, a disposable inline filter is provided on the lavage inlet hose. A lavage flow control valve is provided in the handpiece. The handpiece rest groove 11G is integral to the top housing to ensure ease of cleaning. Preferably, the on/off control is combined with the rotary power control for ease of use. Power indicator light 11P is preferably a green LED and located below the power control to indicate DC power on. Preferably, all unit heat-generating components are isolated from the lavage path to reduce handpiece heat generation. The lavage minimum input pressure is preferably 1.034 bar (15 psig). This allows adequate lavage flow through the unit in areas with low water pressure.

[0028] Compressor housing 16 and reservoir 14 are adapted for use with scaler housing 12, all lines are removed from scaler housing 12. Reservoir 14 and scaler housing 12 are snapped together. The foot control, and

handpiece connections are made in the back of compressor housing 16. All electrical connections are made via inner compressor control connector 44 (for example an interconnect board connector) and outer compressor control connector 46 (for example a mating receptacle) supported by scaler housing 12. The lavage passes through valve 50, which preferably is an integral solenoid and pressure regulator. The output pressure is preferably set to 1.034 $\pm$ 0.069 bar (15 $\pm$ 1 psig). This is to maintain consistent lavage output with varying input pressure. The solenoid is downstream of the regulator. Flow run on is minimized when the footswitch is depressed and released. An integral phase lock loop system is preferably used to ensure peak performance for a multitude of different 25 kHz scaling inserts. A voltage sensing circuit is preferably used to reduce the effects load and line variations that may be seen at the output of the switching power supply.

[0029] When compressor housing 16 and reservoir 14 are used with scaler housing 12, the footswitch, power supply, water inlet hose and handpiece hose are removed from the unit. The scaler housing 12 is preferably connected to compressor housing 16 and reservoir 14. They are connected, for example, by plugging compressor control connector 44 (for example a rear PCB edge card connector) from compressor housing 16 into the (PCD edge) card receptacle 46 of scaler housing 12. Scaler housing 12 is snapped together with the compressor housing 16 and reservoir 14. Perferably the retaining mechanism is a plastic latch and strike. The catch 38 is connected to the scaler base 12B by catch connector 38C. The footswitch, power supply and handpiece are connected to their respective locations on the rear of compressor housing 16. Power, footswitch and handpiece connections are preferably made via the PCB edge card connection.

[0030] A small diaphragm air compressor is preferably utilized to pressurize the reservoir chamber in reservoir container 14 to 1.034-1.31 bar (15-19 psig). This provides pressure to propel the lavage liquid from reservoir 14. A lavage outlet 57C is located on the bottom of one end of one sixth turn connector 32 adjacent to and enclosed by an opening wall on the end of reservoir container 14 opposite from cap 12C. This preferably is connected to an isolation solenoid valve. The output of this solenoid valve is then preferably connected to the handpiece receptacle lavage port. This gives the benefit of the fluid path only passing through the reservoir container 14. Utilizing all autoclavble components preferably enables the entire unit is autoclaved.

[0031] Preferably, the reservoir container 14 holds a volume of 450-500 ml of liquid such as sterile water. The reservoir container 14 is mated to the rear dispenser with a 60° turn. The front feet are integral to the reservoir container 14. An O-ring between the container 14 and the rear support create the seal. Preferably, the reservoir container 14 is steam autoclavable.

[0032] In accordance with a preferred embodiment of the invention is provided a dental scaler and reservoir system comprising a dental scaler system, comprising: a scaler comprising a scaler housing enclosing a scaler conduit and scaler valve and a handpiece comprising a handpiece housing enclosing a handpiece valve and a handpiece conduit, the handpiece valve is connected in fluid flow communication through the scaler conduit and the handpiece conduit to the scaler valve. Preferably, the handpiece further comprises a scaling tip, and the handpiece valve is connected in fluid flow communication to the scaling tip.

[0033] A dental scaler system may be used in a method comprising: providing a second scaler conduit and a dental scaler system comprising a scaler system comprising a scaler housing enclosing a first scaler conduit, and scaler valve. The second scaler conduit not is connected in fluid flow communication with the scaler valve. A handpiece system is provided comprising scaler tip and a handpiece housing enclosing a handpiece conduit and handpiece valve. The handpiece conduit is connected in fluid flow communication to the scaler conduit. A first fluid is conveyed through the first scaler conduit, scaler valve, and handpiece valve to the scaler tip. A second fluid is conveyed through the second scaler conduit, and handpiece valve to the scaler tip, and the tip is positioned adjacent to a tooth in a patient's mouth to scale the tooth. Preferably, the method further comprises providing a compressor comprising a compressor housing enclosing a reservoir valve and an air compressor, and a reservoir comprising a reservoir housing having a reservoir inner chamber, the reservoir valve is connected in fluid flow communication to the scaler conduit and to the reservoir inner chamber.

[0034] A dental scaler system may be used in a method comprising: providing a dental scaler connected to a tip and a reservoir containing a first liquid, ultrasonically moving the tip while conveying at least a portion of the first liquid to the tip, and ultrasonically moving the tip while conveying at least a portion of a second liquid to the tip. Preferably, first liquid is pressurized in the reservoir by pressurized air conveyed to the reservoir from a compressor enclosed in a compressor housing and the compressor housing is connected to the compressor housing. Preferably, the second liquid is water conveyed to the dental scaler system by a water distribution conduit system connecting a plurality of locations.

[0035] A dental scaler system may be used in a method comprising: providing a first scaler conduit and a dental scaler system comprising a scaler system comprising a scaler housing enclosing a second scaler conduit, and scaler valve. The first scaler conduit is not connected in fluid flow communication with the scaler valve. A handpiece system is provided comprising scaler tip and a handpiece housing enclosing a handpiece conduit and handpiece valve, connecting the handpiece conduit in fluid flow communication to the first scaler conduit. A first fluid is conveyed through the first scaler conduit, scaler valve, and handpiece valve to the scaler tip. The hand-

piece conduit is connected in fluid flow communication to the second scaler conduit, and a second fluid is conveyed through the second scaler conduit, and handpiece valve to the scaler tip. Preferably, the dental scaler system further comprising positioning the tip adjacent to a tooth in a patient's mouth and scaling the tooth. Preferably, the method of using a dental scaler system further comprising providing a compressor system comprising a compressor housing enclosing a reservoir valve and an air compressor, and a reservoir system comprising a reservoir housing having a reservoir inner chamber, the reservoir valve being connected in fluid flow communication to the second scaler conduit and to the reservoir inner chamber. Preferably, the reservoir housing is releasably connected to the scaler housing through a releasable connectors, whereby lifting the scaler housing lifts and supports the the reservoir housing through the releasable connectors. Preferably, the eservoir housing is releasably connected to the compressor housing through a rotatable connector, whereby lifting the compressor housing lifts and supports the the reservoir housing through the rotatable connector. Preferably, the reservoir housing has at least two reservoir housing feet and the scaler housing has at least two scaler housing feet, and the reservoir housing feet are supported by a substantially horizontal surface and the scaler housing feet are supported by the reservoir housing.

[0036] A dental scaler system may be used in a method comprising: providing a dental scaler system comprising a scaler system, a compressor system and a handpiece system. The scaler system comprising a scaler housing enclosing a scaler conduit, and scaler valve. The compressor system comprising a reservoir and a compressor housing enclosing a compressor and a compressor conduit. the reservoir comprising a container enclosing reservoir fluid in a container chamber. The handpiece system comprising scaler tip and a handpiece housing enclosing a handpiece conduit and handpiece valve. The handpiece conduit is connected in fluid flow communication to compressor conduit. At least a portion of the reservoir fluid is conveyed through the compressor conduit, scaler valve, and handpiece valve to the scaler tip. The handpiece conduit is connected in fluid flow communication to the scaler conduit and water conveyed through the scaler conduit, and handpiece valve to the scaler tip. Preferably, the method of using a dental scaler system further comprises positioning the tip adjacent to a tooth in a patient's mouth and scaling the tooth. Preferably, when the handpiece conduit is connected in fluid flow communication to the compressor conduit, the compressor housing is connected to the scaler housing and the reservoir housing, and the scaler handpiece is supported by the reservoir housing. Preferably, when the handpiece conduit is connected in fluid flow communication to the scaler conduit, the scaler housing is supported by a substantially horizonal surface.

[0037] A dental scaler system may be used in a method comprising: providing a scaler system, and a compressor system. The scaler system comprises a scaler housing enclosing an electrical dental scaler circuit connected by an electrical conductor an electrical scaler connector, scaler conduit connected to a scaler valve. The compressor system comprises a reservoir and a compressor housing enclosing an electrical compressor connector connected by an electrical conductor to a compressor and a compressor conduit connected to the reservoir. The reservoir comprises a container enclosing reservoir fluid in a container chamber. The electrical dental scaler circuit produces ultrasonic oscilating current while the electrical compressor connector and the electrical scaler connector are connected, the scaler housing is supported by the reservoir and the compressor conduit is in fluid flow communication with a handpiece. The electrical dental scaler circuit produces ultrasonic oscilating current while the electrical compressor connector and the electrical scaler connector are disconnected, the scaler housing and the compressor housing are separated and the scaler conduit is in fluid flow communication with a handpiece. Preferably, the scaler housing encloses a scaler conduit. Preferably, the method further comprises providing a handpiece system comprises a scaler tip and a handpiece housing enclosing a handpiece conduit and handpiece valve, connecting the handpiece conduit in fluid flow communication to the scaler conduit, conveying water through the scaler conduit, and handpiece valve to the scaler tip, connecting the handpiece conduit in fluid flow communication to compressor conduit, and conveying at least a portion of the reservoir fluid through the compressor conduit, scaler valve, and handpiece valve to the scaler tip.

Claims

1. A dental scaler and reservoir system (10), comprising:

(i) a scaler housing (12) enclosing a scaler valve,
(ii) a compressor housing (16) enclosing a reservoir valve (56) and a compressor (60),
(iii) a reservoir housing (14) having an inner chamber, and
(iv) a handpiece housing enclosing a handpiece valve (54), a handpiece conduit, and a vibrational member,

said scaler housing (12) being supported by said reservoir housing (14), and
said compressor housing (16) being supported by and connected to said scaler housing (12) and said reservoir housing (14),
said compressor (6) is connected to a compressor conduit (62), said compressor conduit (62) being connected to said inner chamber of said reservoir housing (14) thereby providing fluid flow communication between said compressor (60) and said inner

chamber of said reservoir housing (14),
said inner chamber of said reservoir housing (14) being connected to a reservoir conduit (57), said reservoir conduit (57) being connected to said reservoir valve (56) thereby providing in fluid flow communication between said inner chamber and said reservoir valve (56),
said reservoir valve being connected to a handpiece conduit (58), said handpiece conduit (58) being connected to said handpiece valve (54) thereby providing fluid flow communication between said reservoir valve (56) and said handpiece valve (54).

Patentansprüche

1. Zahnsteinentfemungs- und -sammelsystem (10), das aufweist:

(i) ein Entfernergehäuse (12), das ein Entfernerventil einschließt,
(ii) ein Kompressorgehäuse (16), das ein Sammelbehälterventil (56) und einen Kompressor (60) einschließt,
(iii) ein Sammelbehältergehäuse (14), das eine Innenkammer aufweist, und
(iv) ein Handstückgehäuse, das ein Handstückventil (54), eine Handstückleitung und ein Vibrationselement einschließt,

wobei das Entfernergehäuse (12) durch das Sammelbehältergehäuse (14) gehalten wird, und
das Kompressorgehäuse (16) durch das Entfernergehäuse (12) und das Sammelbehältergehäuse (14) gehalten und damit verbunden ist,
der Kompressor (60) mit einer Kompressorleitung (62) verbunden ist, die Kompressorleitung (62) mit der Innenkammer des Sammelbehältergehäuses (14) verbunden ist, wobei eine Fluidflussverbindung zwischen dem Kompressor (60) und der Innenkammer des Sammelbehältergehäuses (14) bereitgestellt wird,
die Innenkammer des Sammelbehältergehäuses (14) mit einer Sammelbehälterleitung (57) verbunden ist, die Sammelbehälterleitung (57) mit dem Sammelbehälterventil (56) verbunden ist, wobei eine Fluidflussverbindung zwischen der Innenkammer und dem Sammelbehälterventil (56) bereitgestellt wird,
das Sammelbehälterventil mit einer Handstückleitung (58) verbunden ist, die Handstückleitung (58) mit dem Handstückventil (54) verbunden ist, wodurch eine Fluidflussverbindung zwischen dem Sammelbehälterventil (56) und dem Handstückventil (54) bereitgestellt wird.

Revendications

1. Système de réservoir et de détartreur dentaire (10), comprenant :

(i) un logement de détartreur (12) enfermant une valve de détartreur,
(ii) un logement de compresseur (16) enfermant une valve de réservoir (56) et un compresseur (60),
(iii) un logement de réservoir (14) comportant une chambre interne, et
(iv) un logement de pièce à main enfermant une valve de pièce à main (54), un conduit de pièce à main, et un élément vibrant,

ledit logement de détartreur (12) étant supporté par ledit logement de réservoir (14), et
ledit logement de compresseur (16) étant supporté par, et relié à, ledit logement de détartreur (12) et ledit logement de réservoir (14),
ledit compresseur (6) est relié à un conduit de compresseur (62), ledit conduit de compresseur (62) étant relié à ladite chambre interne dudit logement de réservoir (14), ce qui crée une communication d'écoulement de fluide entre ledit compresseur (60) et ladite chambre interne dudit logement de réservoir (14),
ladite chambre interne dudit logement de réservoir (14) étant reliée à un conduit de réservoir (57), ledit conduit de réservoir (57) étant relié à ladite valve de réservoir (56), ce qui crée une communication d'écoulement de fluide entre ladite chambre interne et ladite valve de réservoir (56),
ladite valve de réservoir étant reliée à un conduit de pièce à main (58), ledit conduit de pièce à main (58) étant relié à ladite valve de pièce à main (54), ce qui crée une communication d'écoulement de fluide entre ladite valve de réservoir (56) et ladite valve de pièce à main (54).

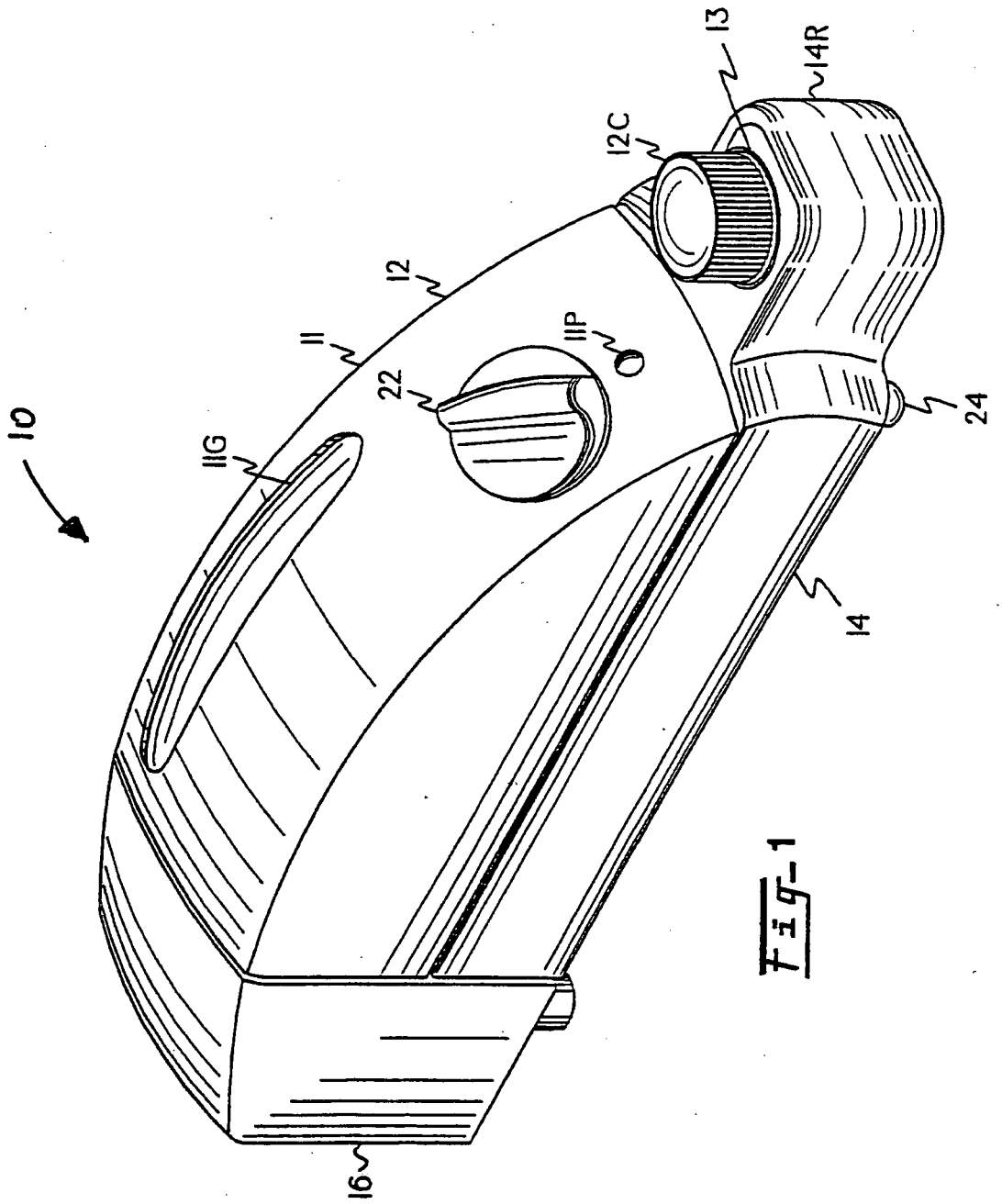


Fig-1

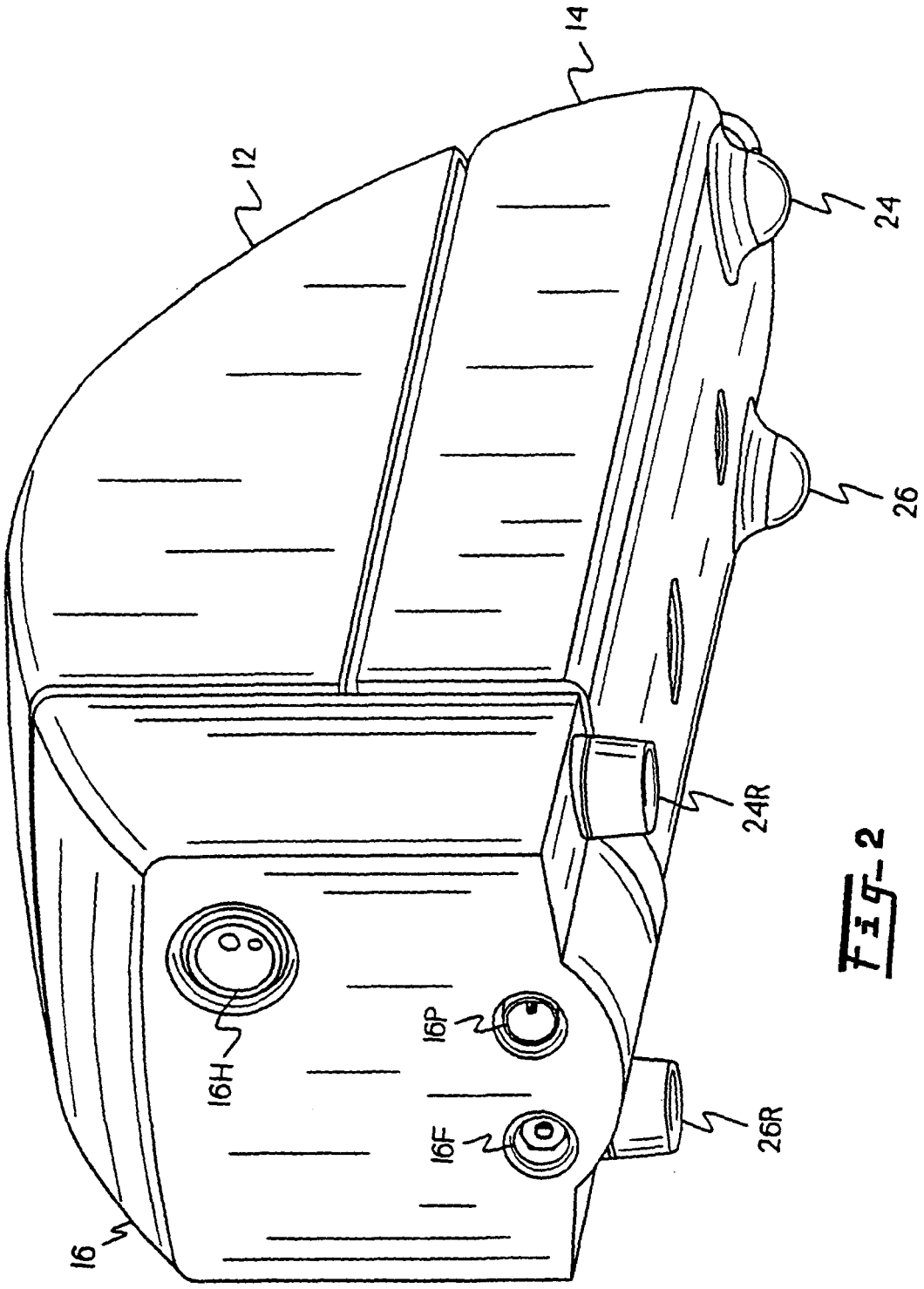


Fig-2

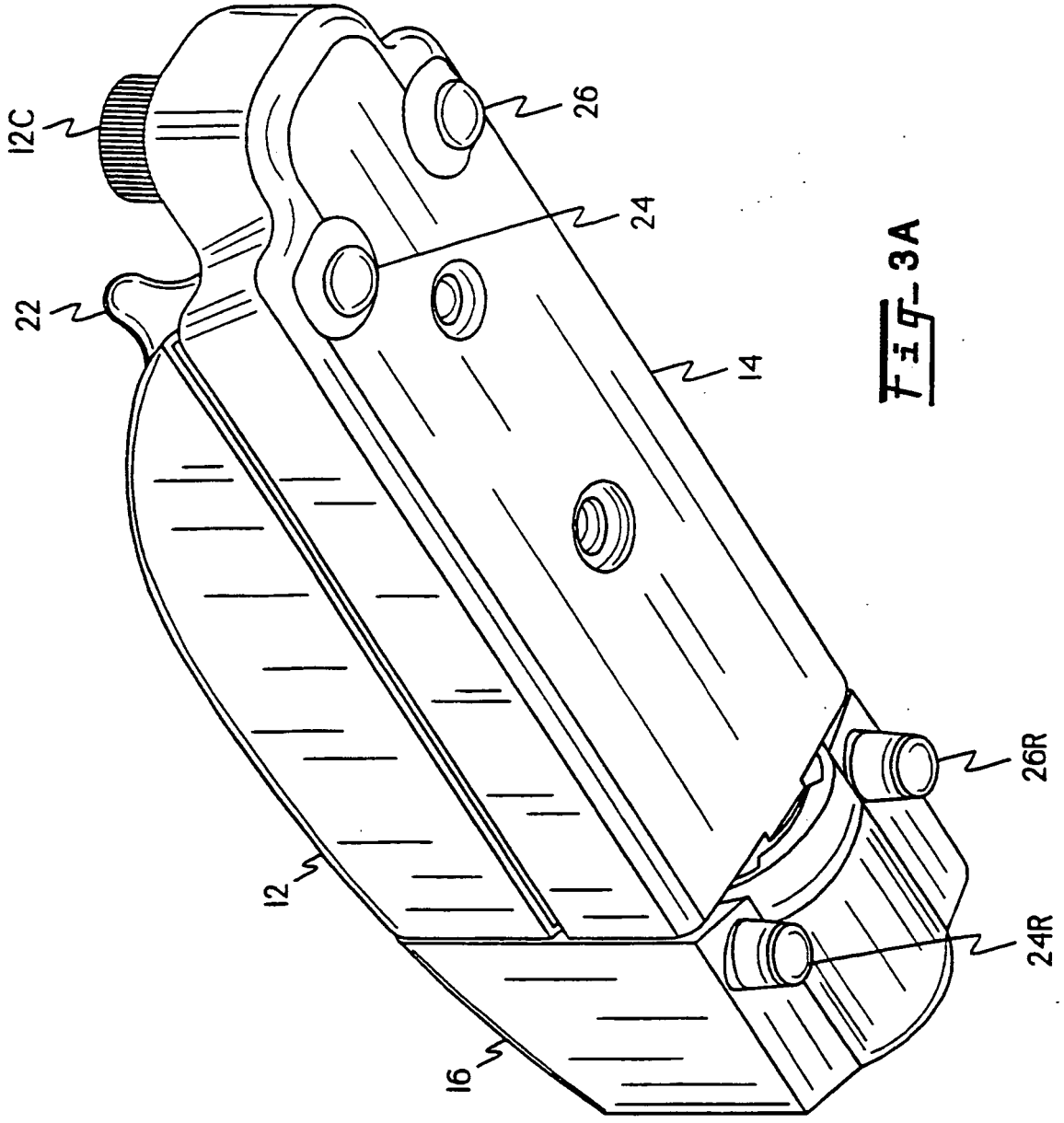


Fig. 3A

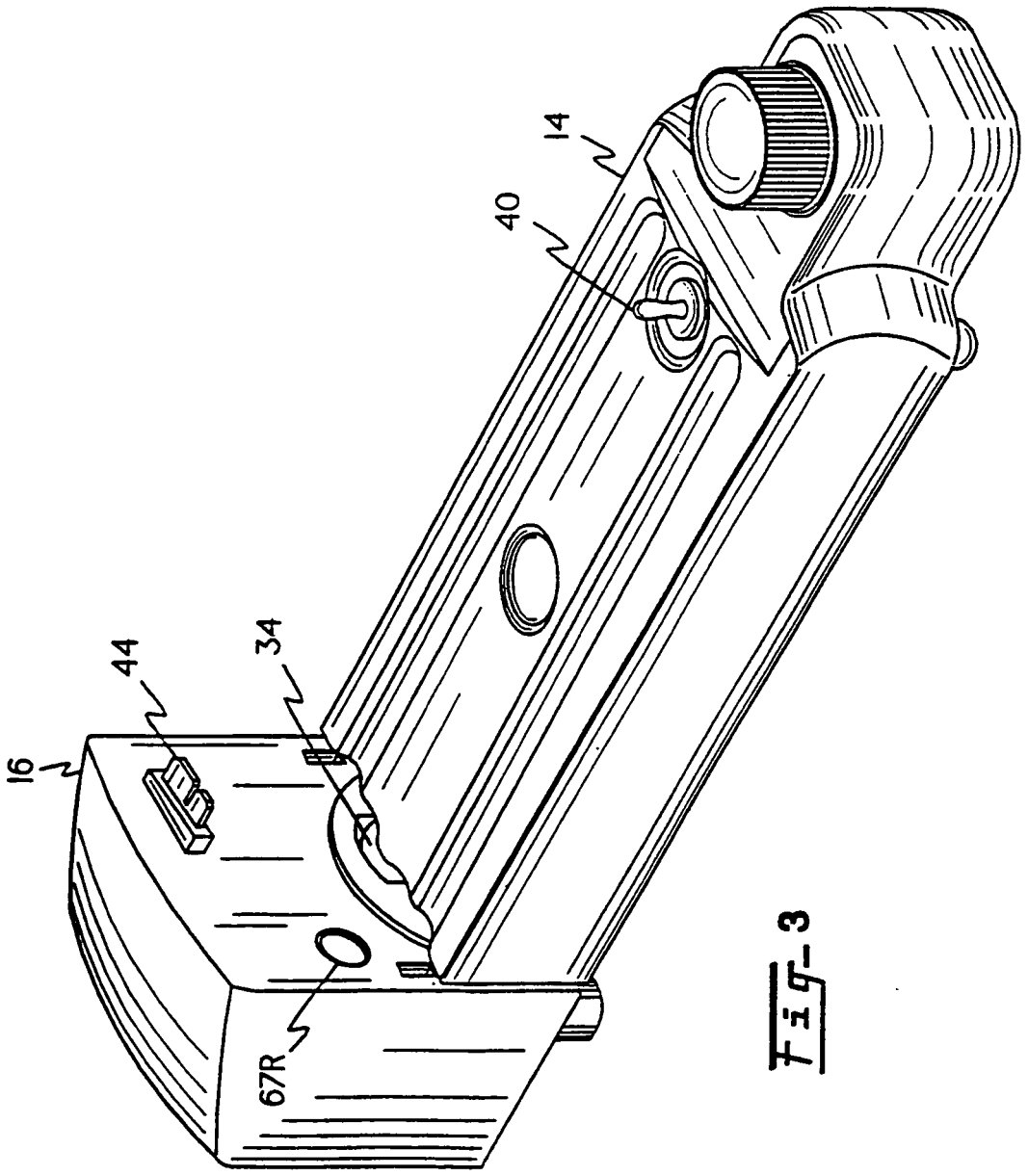


Fig. 3

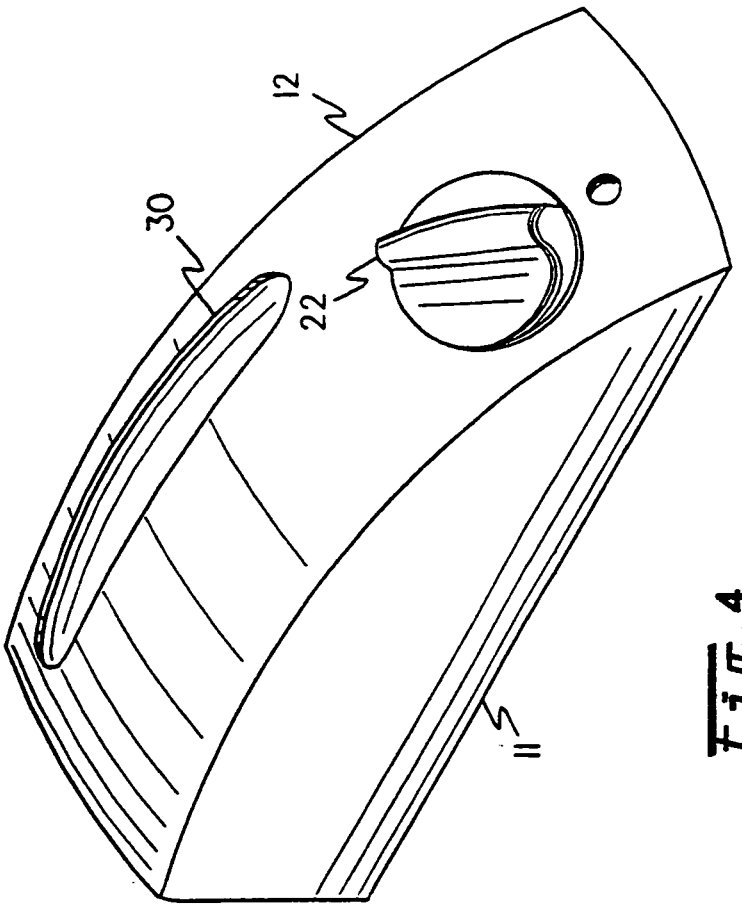


Fig. 4

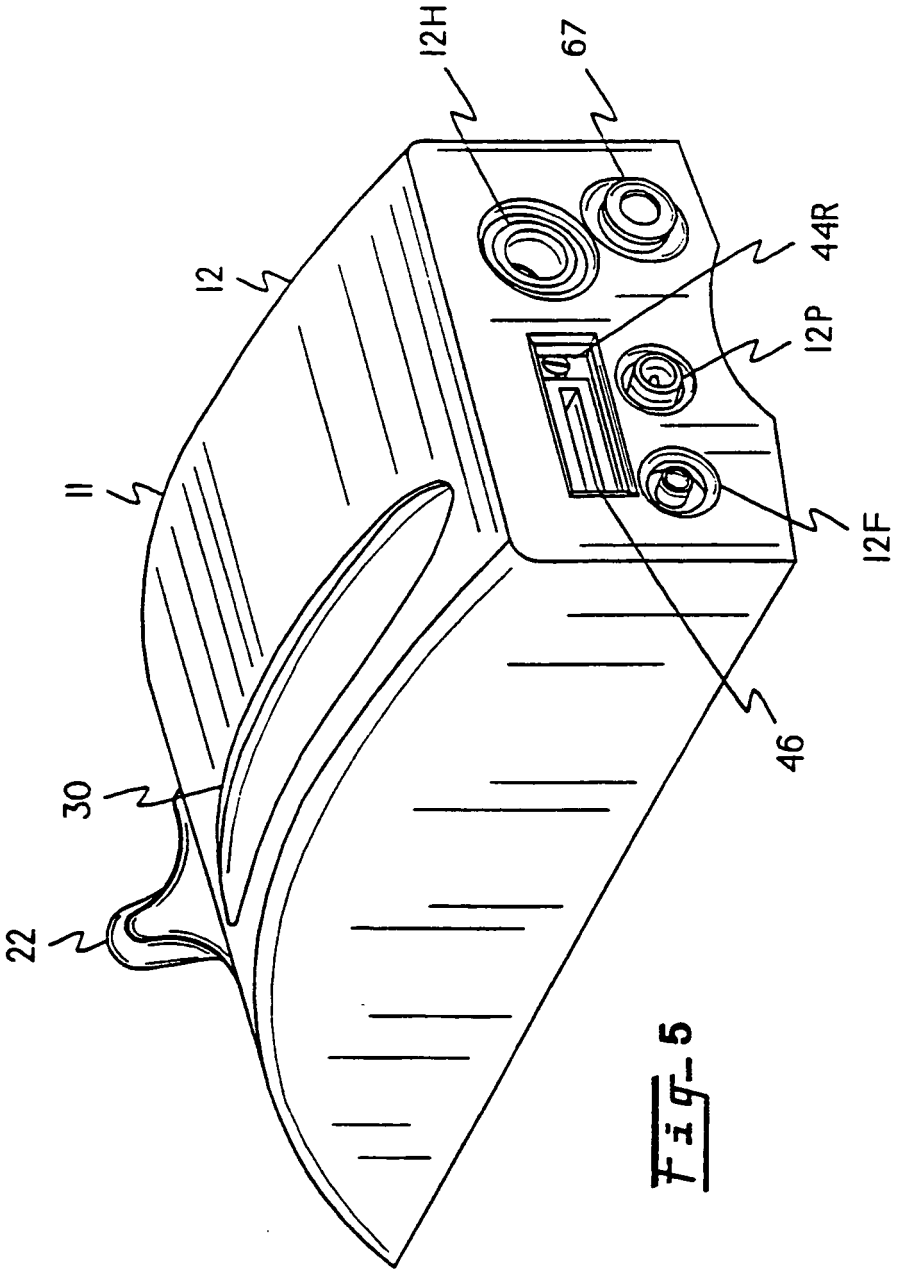


Fig_5

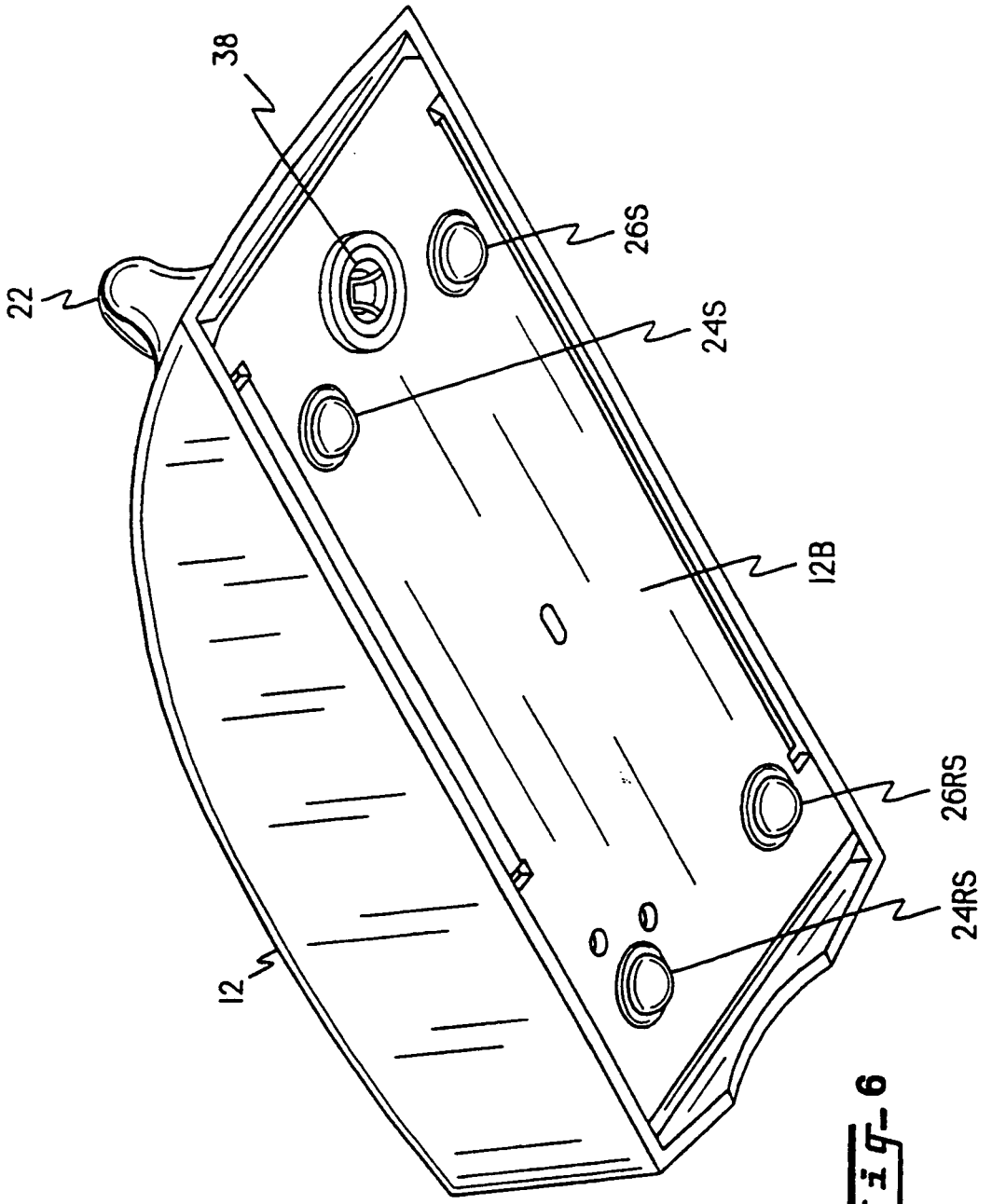


Fig. 6

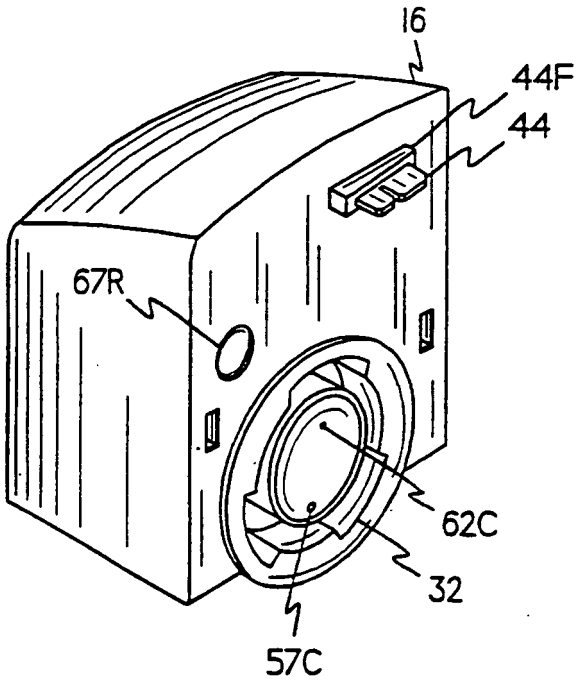


Fig. 7

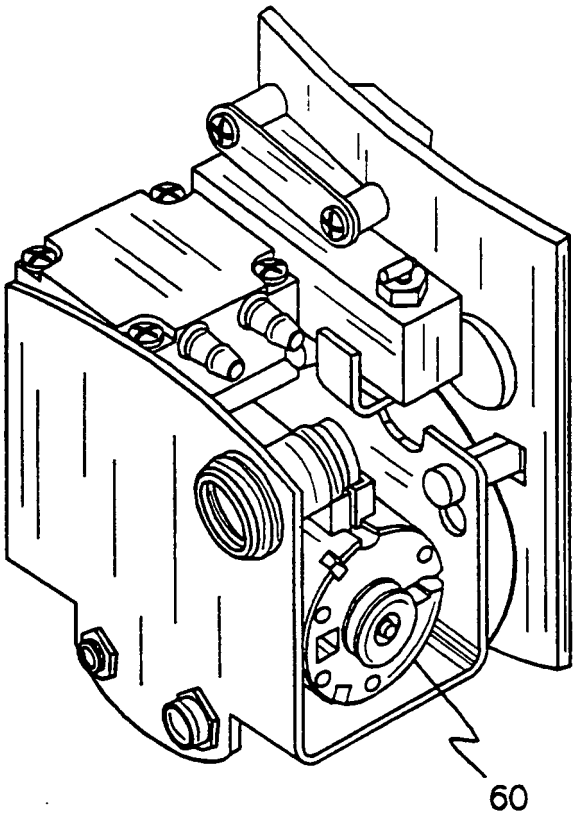


Fig. 8

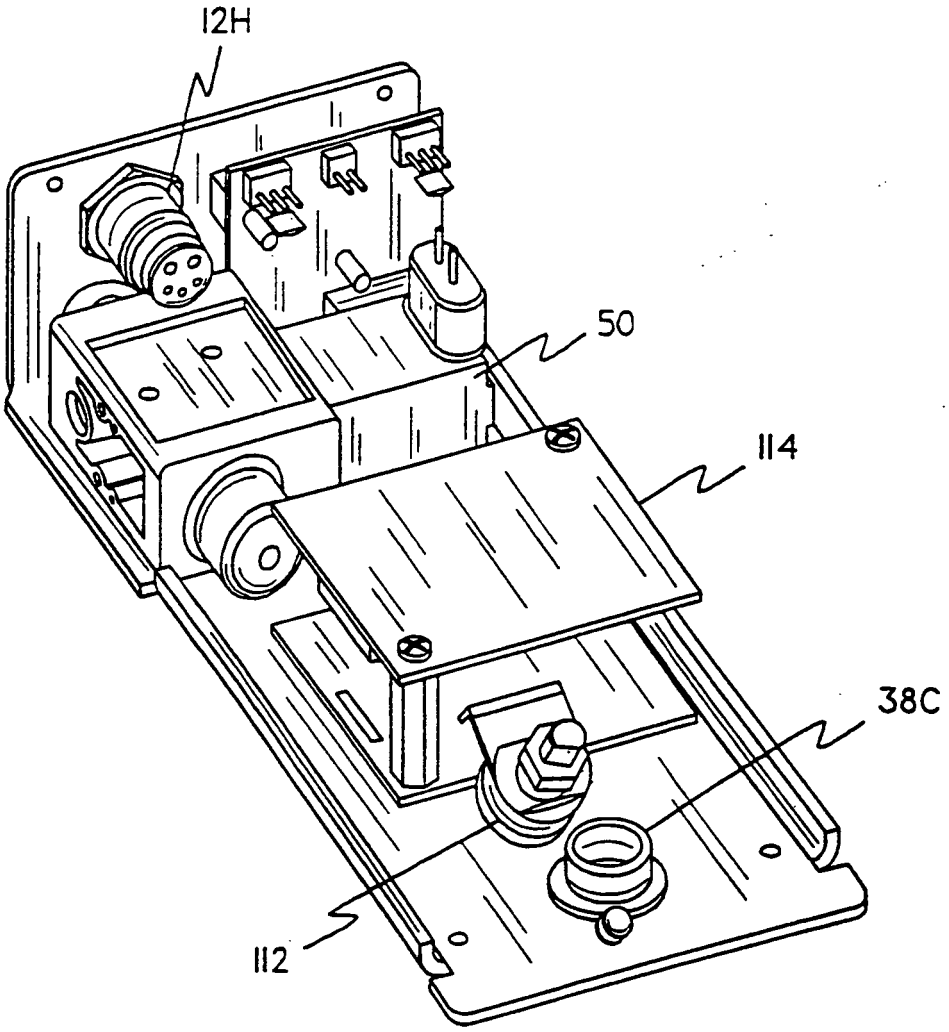


Fig. 9

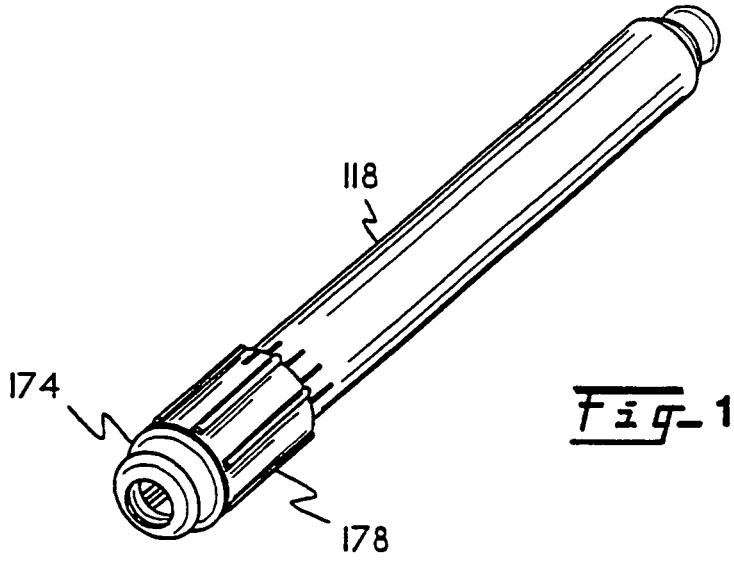


Fig. 10

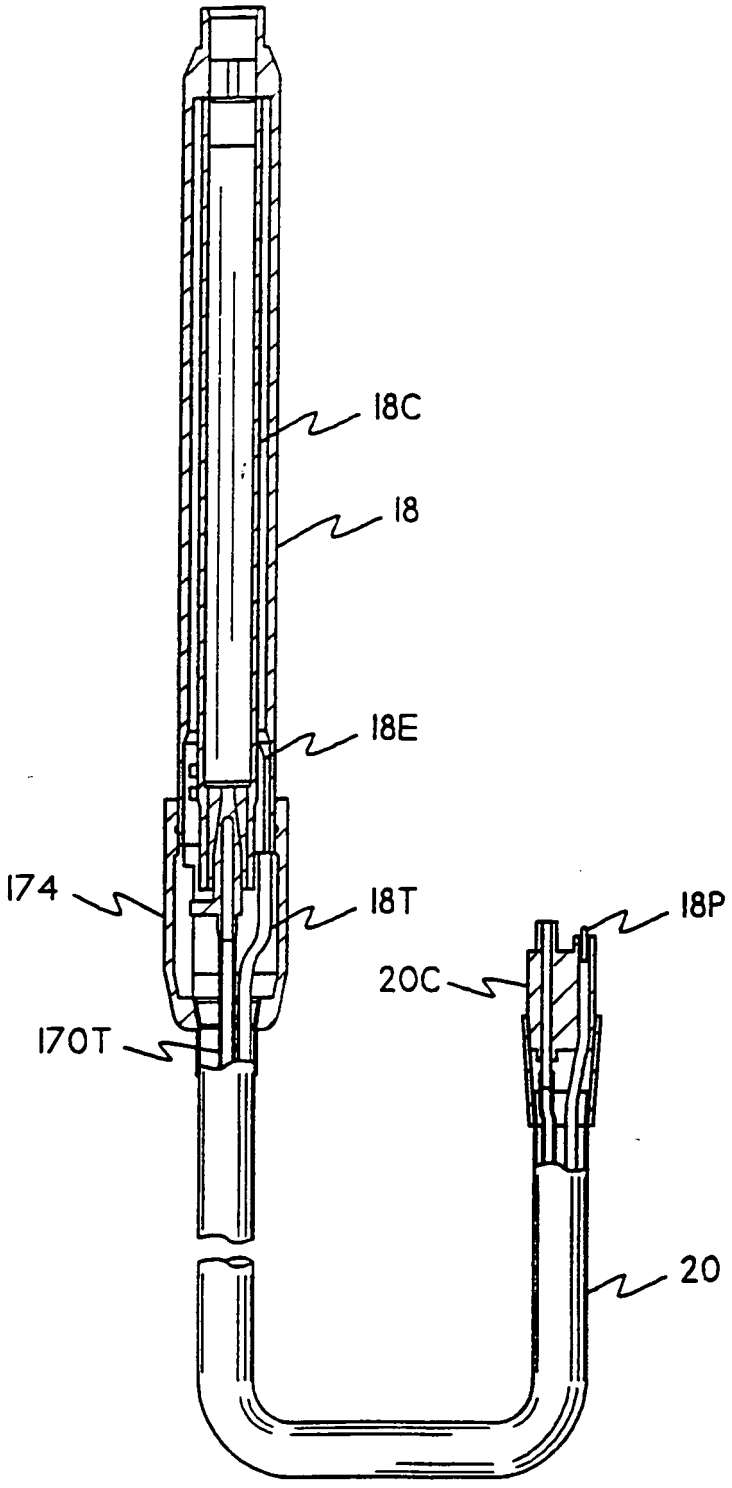


Fig. 10A

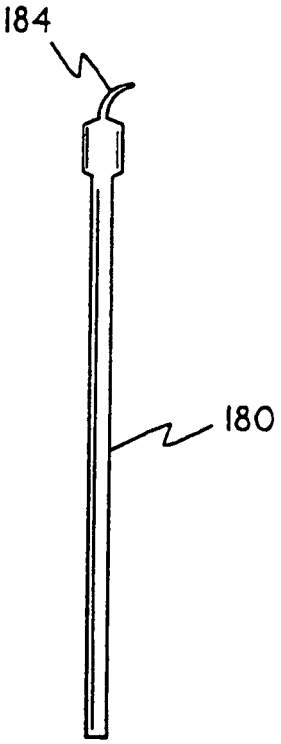


Fig. 10B

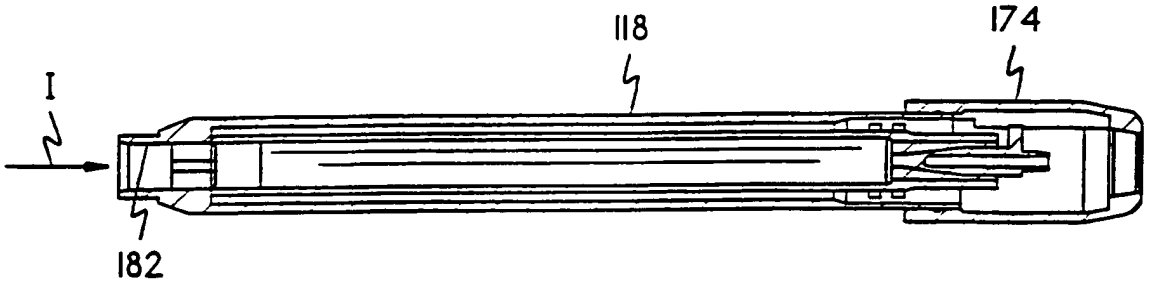


Fig. 11

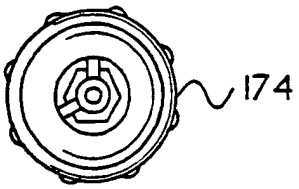


Fig. 12

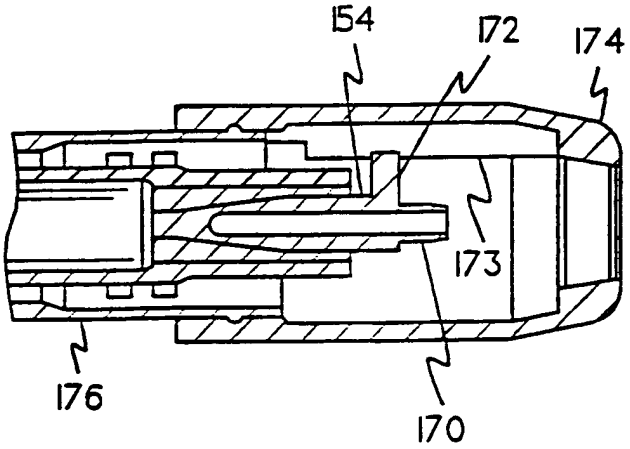


Fig. 13

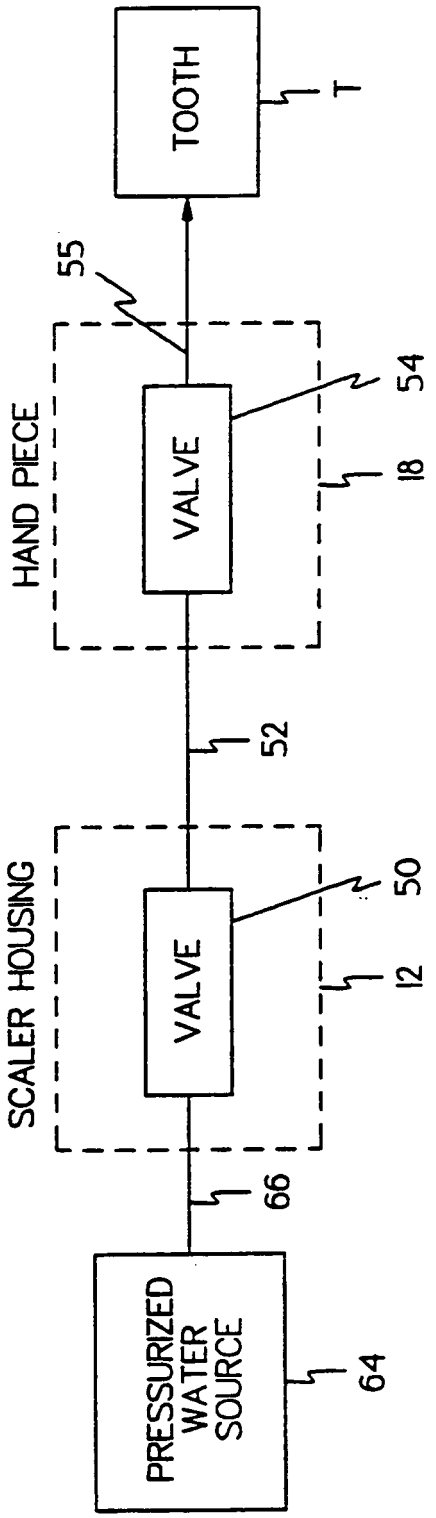

TOOTH
T
55
HAND PIECE
VALVE
54
18
52
SCALER HOUSING
VALVE
50
12
66
PRESSURIZED WATER SOURCE
64

Fig. 14

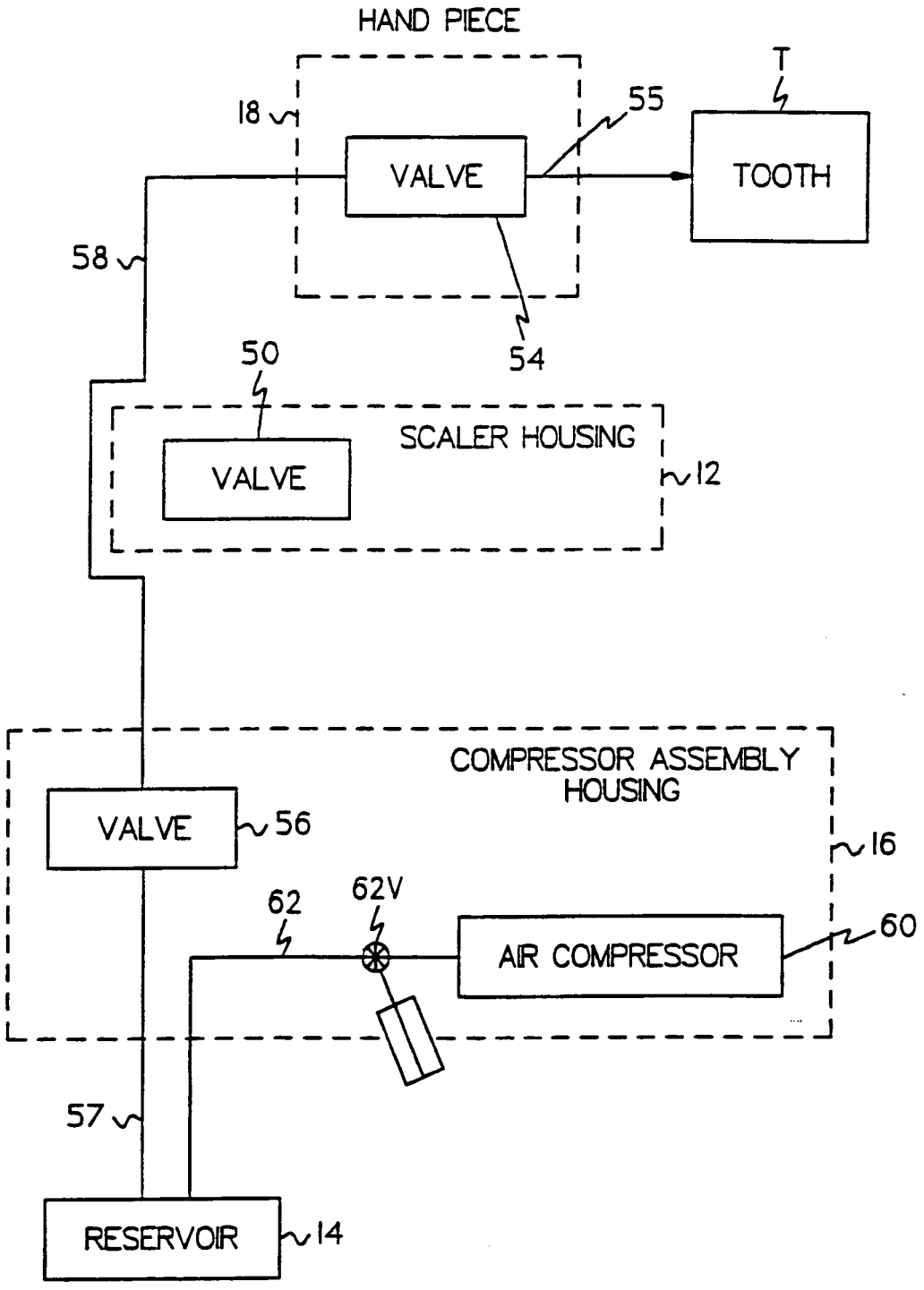

HAND PIECE
18
55
T
VALVE
TOOTH
58
54
50
SCALER HOUSING
VALVE
12
COMPRESSOR ASSEMBLY HOUSING
VALVE
56
16
62
62V
AIR COMPRESSOR
60
57
RESERVOIR
14

Fig. 15

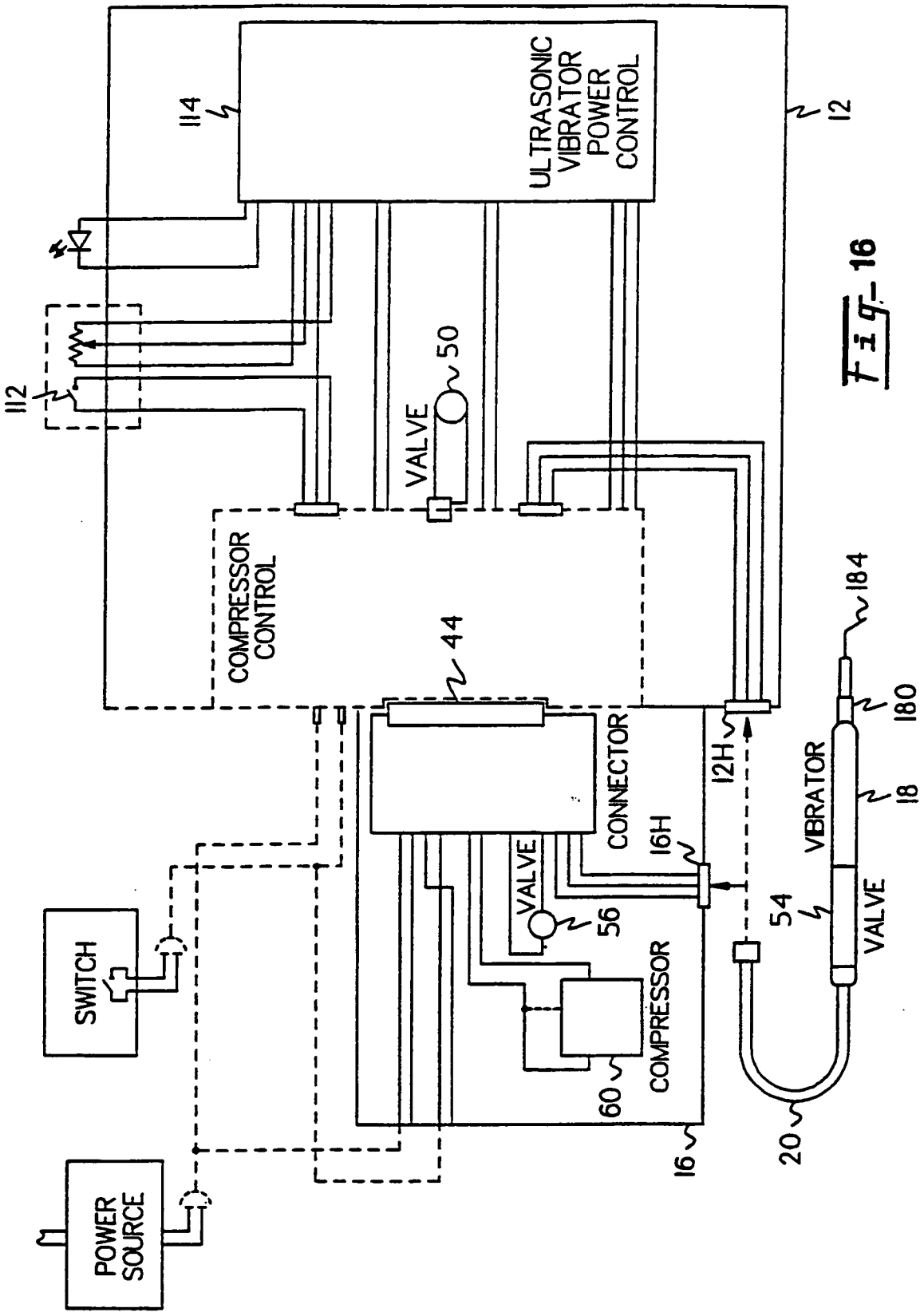

ULTRASONIC VIBRATOR POWER CONTROL
114
12
112
VALVE
50
COMPRESSOR CONTROL
44
CONNECTOR
12H
16H
184
180
18
VIBRATOR
VALVE
54
56
SWITCH
COMPRESSOR
60
16
20
POWER SOURCE

Fig. 16